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STRATEGY RESEARCH PROJECT

CONSIDERATIONS FOR A DEPARTMENT OF DEFENSE ENVIRONMENTAL SECURITY POLICY IN MILITARY OPERATIONS OTHER THAN WAR

BY

COLONEL THOMAS A. HOLDEN JR. United States Army

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USAWC STRATEGY RESEARCH PROJECT

Considerations for a Department of Defense Environmental Security Policy in Military Operations

Other Than War

by

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ABSTRACT

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The Department of Defense (DOD) does not have an environmental security policy for military operations other than war (MOOTW). This paper draws upon the author's experience during Operation Uphold Democracy to identify issues to be addressed in a future policy which would regularize the interagency process. DOD must capitalize upon the Department of State's regional environmental hubs to achieve a synergistic interagency effect which would be exportable into MOOTW. This process must facilitate mission transfer to a follow-on international organization or other agencies without major environmental remediations or reparations that jeopardize US policy objectives by delays and/or negative media exposure.

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CONSIDERATIONS FOR A DEPARTMENT OF DEFENSE ENVIRONMENTAL SECURITY POLICY IN MILITARY OPERATIONS OTHER THAN WAR

Defense and the environment is not an either/or proposition. To choose between them is impossible in this real world of serious defense threats and genuine environmental concerns.

---Secretary of Defense Dick Cheney

THE ROAD TO JACMEL

On March 25, 1995, Captain Osborne stood proudly in front of his multi-national engineer company having participated in the turn-over ceremony of the repaired route 204 connecting the southern city of Jacmel to the Haitian capitol, Port-Au-Prince. Haitian President Jean Bertrand Aristide's representative accepted the completed project from Major General Fisher, Commander, Multi-National Forces (MNF), Haiti. Ambassador Swing, US Ambassador to Haiti, Major General Kinzer, Commander, United Nations Mission in Haiti (UNMIH) and the Mayor of Jacmel also participated. The road repair facilitated transfer of the US-led MNF mission to UNMIH. The project satisfied a UN request that route 204 be passable during the upcoming rainy season since several UN basecamps would be located south of Port-Au-Prince.

What does route 204 have to do with environmental security? In addition to ensuring a dependable resupply route for UNMIH, route 204 typifies the kind of mission falling under the environmental security mantle. 4 Since Tropical Storm Gordon damaged route 204 in November 1994, the US Agency for International Development's (AID) objective of Haitian economic recovery was at risk. Moving cash crops such as citrus fruits and coffee beans to Port-Au-Prince was essential to revitalizing one segment of the Haitian economy. AID's agenda included opening a dependable transportation link to facilitate humanitarian relief activities in southern Haiti being carried out by non-governmental organizations (NGOs) and private volunteer organizations (PVOs). Repairing route 204 also supported the US policy intervention objective of market reform. Since AID is a subordinate agency in the Department of State (DOS), Ambassador Swing and the US mission were stakeholders in the mission to open route 204.6

Opening route 204 typifies the fiscal challenges facing operational commanders undertaking environmental security missions. It demonstrates what is possible through interagency and host nation coordination. Most critical, however, it demonstrates the need for a Department of Defense policy to

implement environmental security in Military Operations Other Than War (MOOTW).

NEEDED -- A DOD ENVIRONMENTAL SECURITY POLICY

We at the Defense Department echo our colleagues at State in our firm belief that the environment can and does play a key role in advancing our foreign policy and security objectives.

-Sherri Wasserman Goodman

The US military fights and wins our nation's wars. It must be trained, worldwide deployable and able to accomplish a spectrum of missions. Recently, the military has undertaken non-traditional missions in MOOTW: the intervention in Haiti, humanitarian assistance in Rwanda, peacekeeping in Somalia and peace enforcement in Bosnia. The pace and variety of these missions is likely to continue in the foreseeable future. Each mission presents complex challenges cutting across political, social, military, legal and cultural lines. Today, there is an added factor, the heightened awareness of and concern for environmental impacts. 8

The thesis of this monograph is that DOD needs a definitive environmental security policy for MOOTW in order for US military operations to support the National Security Strategy and National Military Strategy. This is a relatively new requirement. The

Administration, the Congress and the US public expect DOD be an environmental steward at home and abroad. MOOTW requires close coordination and integration of DOD and other US agencies' activities. An effective policy establishes the framework through prescriptive guidance at the strategic level that carries over into campaign planning and execution down to the Combatant Commander in the operational theater. Unfortunately, Commanders currently rely on common sense and extrapolation from other documents when it comes to MOOTW. This paper examines environmental challenges faced in Haiti to develop considerations for inclusion in an environmental policy for MOOTW. These considerations are a litmus test forged from experience that should be useful to the drafters of this policy. 10

ENVIRONMENTAL SECURITY DEFINED

Environmental security may then be defined as a normative linkage designed to cope with the negative linkages between the environment and human activities.

—Nina Groeger¹¹

In an article on environmental security for the 21st century,
Marvin Soroos provides two definitions of environmental
security. Broadly, environmental security attempts to thwart
or minimize ecological developments threatening the welfare of

human societies even without the increased likelihood of war.

This encompasses issues currently being addressed by DOS such as ozone depletion and deforestation. It leads to treaty agreements to reduce the human impact preserving resources for future generations. This definition encompasses issues beyond the purview of DOD.

Soroos' second definition is applicable to DOD. He defines environmental security as actions to mitigate resource scarcities and environmental degradation that create, intensify or exacerbate existing conditions which can precipitate international conflict thereby increasing the likelihood of war. The conflict may be within a failed nation state resulting from internal civil strife such Haitian refugees fleeing oppression. It may also be between nation states over resources such as access to water, a potential crisis currently faced in the middle-east between Israel and Jordan over the Jordan River.

Author Nina Groeger outlines concerns with implications for an active DOD role in environmental security. 13 First, environmental degradation is a severe threat to human life. Second, environmental degradation can be both a cause and a consequence of violent conflict further heightening ethnic, religious and other socio-economic tensions. Third,

predictability and control are essential elements of military security operations. These are also key to protecting the environment. Lastly, recent events have established a cognitive linkage between environmental degradation and US security.

Groeger's argument points to the military's role in furthering US policy objectives by reducing environmental degradation during MOOTW. From her discussion, the reader can identify the ethical, moral and pragmatic foundations that emphasize MOOTW requires comprehensive planning and careful execution. This mitigates the factors which precipitated the intervention and minimizes the DOD environmental footprint remaining after the MOOTW has ended.

WHY IT IS IMPORTANT

In the past two decades, public perceptions and attitudes towards environmental stewardship have shifted decisively. This is an international as well as a national phenomenon. Mankind's relationship to natural resources will continue to assume greater importance and increased fragility during the 21st Century. Developed nations are becoming less inclined politically and economically incapable of assisting third world nations while environmentally induced unrest and instability is increasing. When conditions deteriorate and US interests are at stake, a US

intervention may be evaluated not only based upon US mitigation of the crisis, but equally upon the US military's ability to conduct the intervention with minimal impact upon the environment.

These crises will occur with increasing regularity and in proximity to densely crowded regions with significant public health and refugee issues which by their nature demand environmental mitigation during military operations. 14 The military must establish the endstate for military withdrawal and more importantly the conditions that best posture other US and international agencies (DOS and the UN) to attain US foreign policy and international goals.

IT IS IN OUR NATIONAL SECURITY STRATEGY

In his 1997 National Security Strategy (NSS), President
Clinton emphasized the importance of environmental security to US
economic prosperity based upon the potential for environmentally
induced crises to threaten US interests abroad. "[T]he dangers
we face are unprecedented in their complexity...environmental
damages and rapid population growth undermine the economic
prosperity and political stability in many countries." These
global concerns transcending national borders include resource
depletion, environmental degradation and refugee migration. 16

Unchecked, they threaten US core values of representative governance, market economies and human rights. President Clinton established six strategic priorities to advance core US national security objectives. Two of these involve environmental security: countering growing dangers resulting from environmental damage, and using diplomatic and military options to meet these challenges. 17

IT IS IN OUR NATIONAL MILITARY STRATEGY

The US National Military Strategy (NMS) embodies three concepts: shaping the international environment, responding to crises and preparing for the future. 18 To prepare for an uncertain future requires Joint and Service environmental security doctrine. This doctrine must support DOD environmental security policy at home and abroad in peace, MOOTW and war. 19 The NMS emphasizes responding to the full spectrum of crises including transnational dangers "other than armed conflict" such as massive refugee flows and threats to the environment. 20

HAITI -- ENVIRONMENTAL ISSUES AND CHALLENGES

The military operation itself went smoothly, and the shift from opposed to permissive entry was accomplished with relative ease. Nevertheless, a number of complications occurred on the ground, largely because of incomplete interagency coordination and other factors that included military and organizations'

mutual ignorance of counterpart culture capabilities.

-Institute for National Strategic Studies²¹

In Haiti, the military faced environmental challenges not addressed in policy or doctrine. It is challenging implementing actions in the absence of DOD policy, Joint or Service doctrine, particularly when actions potentially could have long lasting effects upon the host nation populous, the environment, and coalition forces. This requires careful coordination with the DOS mission, other US agencies, the host nation government, DOD forces, and other interested and effected parties. 22 MEDICAL WASTE DISPOSAL

The MNF medical and dental treatment facilities were located in Port-Au-Prince. 23 By mid-January 1995, four months into the operation, they had generated a large quantity of waste. Official quidance was to dispose of in-country. 24 A potential disposal site was the garbage dump north of Port-Au-Prince. However, thousands of Haitians gleefully awaited the daily arrival of the trash trucks with discarded food stuffs from MNF dining facilities. These starving throngs made military escort a necessity in order for the truck and driver to safely discharge the trash and exit the facility. Inclusion of infectious wastes

in the trash was too great an environmental and health risk. Alternative burial sites were considered, however the waste should be burned at high temperature to kill potentially infectious germs before burial. In early February, a programmed incinerator was put on hold due to funding. In mid-February, a UN representative informed the MNF a solution for medical waste was needed as a precondition to mission transfer. Shortly thereafter, the incinerator was installed and the medical waste destroyed.

HUMAN WASTE DISPOSAL AND WATER SOURCES

with more operational latitude afforded by a permissive entry, the MNF Commander implemented measures to protect soldiers from the unhealthy Haitian environment. These measures mitigated the MNF environmental footprint through the most practical environmental engineering and sanitary practices to protect the environment tempered by operational constraints of existing conditions, force protection and mission accomplishment. Human waste disposal, potable water and nonpotable water for bathing topped the list. 27

Initially, the forces used slit trenches. There was no public sewerage infrastructure in Haiti. Water for consumption was provided in bottles since all riverine and most aguifer

sources were polluted. Even when it worked, public water was not potable. Although MNF forces were arrayed all over the country, the bulk of MNF forces were concentrated in Port-Au-Prince and Cap Haitien. This situation lent itself to two geographical solutions.

In Port-Au-Prince, the main issue was the potential hazard to local aquifers and the Caribbean Ocean posed by human waste disposal through the logistics capabilities (LOGCAP) contractor. Fortunately, sound disposal measures reduced the environmental impact averting adverse public or media exposure. Local aquifer water was treated then utilized for nonpotable bathing. It was also used for dust control in the basecamps. By February, well after the fall rainy season and prior to the spring rainy season, MNF use of this aquifer began to have its toll. The local beer brewery and several private dwellings surrounding the MNF basecamp where water was drawn began having difficulty pumping water. Given Haiti's poor economy, degradation of any industry could be devastating to the US and the GOH. Stringent measures were employed to reduce MNF consumption.

Human waste disposal practices at Cap Haitien were primitive.

This had potentially contaminated the local aquifer which was approximately 90 feet deep. Fortunately, there was a second and

substantially deeper aquifer which had not been contaminated. A well was installed to replace the MNF reverse osmosis water purification units (ROPU) that had been converting sea water into potable water. These ROPUs would redeploy prior to mission transfer and a solution was needed.

All these issues should have been better coordinated with the DOS country team, GOH, local government officials and the MNF. Had this been done, these last minute measures might have been employed earlier reducing the ground water contamination in Cap Haitien and averting the impact on the local populous during the dry season in Port-Au-Prince.

SEIZED WEAPONS, MUNITION DISPOSAL, AND CLOSING RANGES

Commanders are sensitive to unit readiness. Many consider MOOTW erosive to combat skills. To maintain combat proficiency, the Commander, 10th Mountain Division, utilized an old Haitian Army range northeast of Port-Au-Prince for weapons training and company size live fires.³⁰ The 25th IDL utilized this facility to fire weapons and dispose of captured munitions.³¹

The weapon seizures and weapon buy-back program created several environmental challenges.³² Initially, captured Haitian Army weapons and munitions, and those obtained under the weapons buy-back program were stored in a large container yard

constructed by the 18th Airborne Corps in October 1994. Disposal of these items became a sensitive issue. Options considered included: disposal at sea, burial in concrete and disposal at sea or on land, destruction through open-burning and open-detonation (OB/OD) at the Haitian range complex, or shipment to a treatment site in the US.³³ The Commander, 10th Mountain Division, decided to dispose in-country through OB/OD. Munitions disposal was continued under the 25th IDL. This was time consuming and environmentally unsatisfactory. Numerous dud creating munitions such as 40mm grenades were ejected undestroyed from the OB/OD pits creating a hazardous unexploded ordnance site.³⁴ Eventually, captured weapons not destroyed through OB/OD and most of the weapons acquired through the buy-back program were transported to the US for destruction.

The UN did not want the range complex. Hence, the MNF implemented cleanup measures to return the facility back to the GOH. 35 The impact area was fenced with warning signs emplaced in French and English. The OB/OD site was an entirely different issue. The solution approved by the Department of Defense Explosive Safety Board involved a thorough sweep by explosive ordinance disposal (EOD) personnel to 50 meters beyond the maximum predicted ejecta range from OB/OD activities. This was

followed by a 1 meter layer of earth emplaced on top of an impenetrable polypropylene mat. The mat was selected based on its ability to prevent the upward migration of the dud 40mm grenades. The site was fenced and marked similar to the dud impact areas.

Coordination of the range closure with the GOH, the US country team and other interested parties was easy. Approval through US Forces Command (FORSCOM), US Atlantic Command (ACOM) and ultimately the Joint Staff (JCS) was time consuming. There was no clear guidance, doctrine or policy on how to remediate these environmental issues in MOOTW. The solution developed by the MNF engineer cell in concert with EOD and the MNF SJA applied peacetime range closure procedures involving real property disposal to an unanticipated circumstance arising in MOOTW.

The MNF required property for basecamps, supply points including ammunition supply points and storage of seized munitions, headquarters facilities, and a host of other activities. The engineer cell, augmented by a contract and real estate team (CREST) from ACOM, negotiated leases and contracted local labor. GOH property was coordinated through the US mission and the GOH. Private property was a bit more

challenging. It was seized outright then the owner found and a lease negotiated, or the owner was immediately available and the lease negotiated. Private owners were glad to receive US compensation. Many became inventive in attempts to claim damages due to repairs, improvements and renovations done by the MNF when the CREST negotiated lease terminations in March 1995.

Critical elements in preventing future claims against the US for damages were: a preselection study to ensure the area was not contaminated and a preoccupation site survey with photographs to establish the conditions prevailing before US or other MNF forces occupied the real estate. The CREST was successful in protecting US interests in varying degrees. Preselection studies and coordination with the US mission and the GOH did preclude US and coalition forces from utilizing sensitive ecological sites, and religious and culturally significant or historic sites. In most cases, environmental impacts from poor site selection were averted.

Some facilities in Port-Au-Prince were critical to the downtown presence required by the MNF commander to ensure a safe and secure environment. The industrial complex in the heart of the manufacturing business in Port-Au-Prince was an ideal site to establish MNF headquarters. This came at a cost to Haitian

economic recovery. Some of the occupied buildings in better times produced baseballs and clothing exported under trademarks such as Champion. Economic recovery was placed secondary to military necessity.

Another challenge was remediating MNF damages on basecamps and other sites in Port-Au-Prince and Cap Haitian with the lessors. During the transition period in March 1995, the author and CREST ensured damages brought by the lessor were properly resolved before the leases were transferred. The MNF engineer cell developed basecamp closure procedures for commanders on property being returned to the lessors. A similar procedure was developed to evaluate leased property being transferred to UNMIH.⁴⁰ A joint survey by the lessor, CREST and UNMIH personnel was required to transfer leases to UNMIH.

SUMMARY

Interagency coordination with the US mission, AID, the UN, the GOH and host nation citizens cannot be over emphasized. The aquifer problems at Cap Haitian and Port-Au-Prince might have been avoided had they been surfaced earlier. They became emotional issues as the transfer of mission date approached. Fortunately, the US made the necessary repairs and improvements, however the importance of site surveys, basecamp checklists and

interagency coordination including UNMIH representatives was not lost on those who suffered through these challenges.

THE PLAYERS

There are many parties concerned with environmental security in MOOTW. Before discussing who they are, it is appropriate to discuss what is occurring in the absence of DOD policy.

ACTIONS IN THE ABSENCE OF GUIDANCE

Joint doctrine does not adequately integrate environmental considerations into planning and decision making. Joint Publication 4-04, Joint Doctrine for Civil Engineering Support does not address critical areas such as real estate seizures/leases, contracting, host nation support, NGOs, civil affairs, or political-military interface with DOS. Moreover, there is no mention of impacts from maneuver, fires or other "operator" actions that can adversely impact the environment in MOOTW.

Recognizing this void, the Joint Staff Engineer implemented a template Annex L, Planning Guidance - Environmental

Considerations, Joint Chief's of Staff Manual (CJCSM) 3133.03

dated 1 June 96, to prescribe environmental considerations and define responsibilities. It is the minimum environmental planning requirements for CINC OPLANS and serves as an interim

measure. The Joint Staff Engineer is developing Joint

Publication 3-34, Engineer Doctrine for Joint Operations. The

first draft due in June 98 will contain a chapter on

environmental security planning requirements.

Utilizing the Joint Staff initiative, ACOM J-4 Engineer is conducting training for potential Joint Task Forces. ACOM's exercise program Unified Endeavor, trains potential JTF commanders and staffs to synchronize planning and execution of joint operations including environmental security considerations. This training incorporates interagency coordination. Starting with CJCSM 3033.03, ACOM incorporated lessons learned from recent MOOTWs to develop ACOM Instruction Environmental Security utilized in this training. The JTF's Joint Environmental Management Board (JEMB) produces the Environmental Management Support Plan (EMSP) for a planned operation.

The Army and Marine Corps are jointly developing Field Manual (FM) 20-400, Military Environmental Protection. This FM will describe how environmental considerations affect doctrine and prescribe how a commander should train, deploy, fight and redeploy his/her force while minimizing the environmental footprint. This FM could become the Joint Tactics Techniques and Procedures (JTTP) implementing JP 3-34.

The bad news is that doctrine is preceding policy. The good news is in the absence of DOD guidance on environmental security in MOOTW, the Joint Staff and the Services are improvising, adapting and overcoming the issues. The risk is these doctrinal developments may not be in synch with the policy once it is published.

INTERAGENCY COORDINATION PLUS OTHERS

The traditional synergistic relationship between diplomacy and war has deepened to the point where these two instruments are deeply intertwined in daily activities.

-General George Marshall44

General Marshall's comment is echoed in the NSS:

The U.S. military conducts smaller-scaled contingency operations to vindicate national interests....These operations will also put a premium on the ability of the U.S. military to work closely and effectively with other U.S. Government agencies, nongovernmental organizations, regional and international security organizations and coalition partners.⁴⁵

Application of US elements of power to counter transnational threats to US interests necessitates greater reliance on US agencies such as the Federal Bureau of Investigation, the Drug Enforcement Agency and the Environmental Protection Agency. 46 Interagency coordination is the cornerstone strengthening US military and diplomatic efforts. DOD is a means to US policy

ends. DOD must set the end conditions through its exit criteria for military redepolyment that reinforce US policy objectives in the environmental area.

Who are the players in environmental security in MOOTW? far NGOs, IOs, PVOs, DOS, DOD, FBI, EPA, DEA, coalition partners and the host nation have been mentioned. US agencies such as the Departments of Commerce, Agriculture, and Energy plus national laboratories and other research facilities in academia can and should reorient their resources to support DOD environmental security in MOOTW. Ms Sherri Goodman, Deputy Under Secretary for Defense (Environmental Security), emphasized the intelligence community must refocus priorities to provide early warning of regional transnational threats. 47 She indicates that national reconnaissance systems must be used to track desertification as well as tanks. Mr. John Deutsch, Director, Central Intelligence Agency, echoes Ms Goodman's view stating, "There is an essential connection between environmental degradation, population growth, and poverty that regional analysts must take into account." 48 They recognize the interagency linkage between environmental security and US interests.

Recent experience in failed states like Haiti and Somalia demonstrates US military forces arrive first with the best surge.

capabilities. The military must provide the basic governmental services to re-establish order, turn on utilities and halt further environmental degradation until other US agencies and interested parties arrive with the capabilities to handle these missions. The military can accomplish this only through interagency coordination achieving a whole greater than the sum of its parts. This must be accomplished without the loss of operational security.⁴⁹

KEY RESOURCE -- DOS ENVIRONMENTAL HUBS

DOD and DOS often have different agendas. However, both agencies recognize the increasing role environmental issues play in crisis prevention and resolution. In April 1996, Secretary of State, Warren Christopher, announced the establishment of ten regional environmental hubs to induce diplomats to think regionally. These hubs will be placed in US embassies of key countries to: address pressing regional vice nation state natural resource issues, advance sustainable development goals, and help US businesses sell leading edge environmental technology. Ms Goodman is enthusiastic about this resource to DOD in peace and conflict. DOD must tap these resources to "shape" through peace engagement preparing DOD to "respond" in crises. The

programs. It does work in cooperation with and provides policy guidance to other departments and agencies." These hubs are vehicles to effect better interagency coordination by DOD in planning for and execution of environmental security in MOOTW.

RECOMMENDATIONS

The previous discussion highlights several environmental challenges in Haiti that might have been avoided. The following recommendations are offered for inclusion in the DOD Environmental Security Policy for MOOTW.

Recommendation 1: Interagency coordination to achieve environmental security objectives in MOOTW must be mandated. DOD policy must prescribe an integrating framework with key players at JCS and CINC levels to plan MOOTW. This regularized process must carry over into execution. DOD operations must complement and reinforce DOS foreign policy objectives. To achieve the desired MOOTW environmental end state, DOD must incorporate other US agencies into planning and execution. As a minimum, key players should include DOS representatives and EPA for technical advice. Other agencies can be incorporated on an as needed basis. The principal roadblock is overcoming the operational security bogeyman. DOD must work with other US agencies to develop trusted agents. In this forum, the capabilities and

limitations of civilian agencies and the military can be addressed preventing unrealistic and possibly unrealized expectations during the MOOTW. 53 Agency roles can be clarified and accountability established.

Recommendation 2: DOD must tap the environmental expertise in the DOS regional environmental hubs in planning for and execution of MOOTW. DOS environmental hubs must be utilized at every planning and execution level: JCS, CINC and theater commander. They enable identification of PVOs, NGOs, host nation players and other interested parties. By working with DOS through these hubs, DOD will effect thorough coordination for environmental security during the MOOTW.

Recommendation 3: DOD must assume an international organization such as the UN will be a follow-on force and plan accordingly. Experiences in Haiti demonstrate that the UN required the US-led coalition attain environmental standards before accepting transfer of the mission inspite of the fact US forces were part of UNMIH. DOD must anticipate this in future MOOTWs and establish the environmental end state up front. Items such as human waste disposal, potable water, medical waste and real estate claims are examples of issues that must be specifically addressed.

Recommendation 4: DOD must establish an environmentally acceptable captured munitions and weapons disposal policy. The disposal of captured munitions and weapons in Haiti highlighted a policy void. This issue is larger than just environmental damages, however, if disposal in theater is to be a future option, then DOD environmental security policy must prescribe guidance. One consideration might be development of a deployable smelter under LOGCAP.

CONCLUSIONS

Environmental security in MOOTW requires an interagency solution. DOD must specify how the military will integrate other US agencies' technical support. The process must link US policy objectives with military objectives to establish the most desirable environmental end state within the parameters of operational necessity and expediency. DOD must not contribute to the very conditions which may have produced the need for military intervention. Environmental threats preclude single agency resolution, hence DOD must participate in collective environmental security during MOOTW. Initially, DOD may lead based upon operational capabilities, however, some agency or organization will assume the conditions once DOD redeploys from

the MOOTW. Thus, DOD must minimize the lasting environmental footprint of US forces upon foreign soil in future MOOTWs.

(Word count 5,915)

GLOSSARY OF ACRONYMS

ACOM or USACOM -- United States Atlantic Command

CINC -- Command-in-Chief of a United States Command

CJCSM -- Chairman of the Joint Chiefs of Staff Manual

CREST -- Contract Real Estate Team

DOS -- Department of State

DUSD(ES) -- Deputy Under Secretary of Defense (Environmental Security)

EMSP -- Environmental Management Support Plan

EOD -- Explosive Ordnance Disposal

EPA -- United States Environmental Protection Agency

FORSCOM or USFORSCOM -- United States Forces Command

GOH -- Government of Haiti

IO -- Inter-National Organization

JCS -- Joint Chiefs of Staff

JEMB -- Joint Environmental Management Board

JTTP -- Joint Tactics, Techniques and Procedures

LOGCAP -- Logistics Capabilities Contractor

MNF -- Multi-National Forces

MOOTW -- Military Operations Other Than War

NGO -- Non-Governmental Organization

NMS -- National Military Strategy

NSS -- National Security Strategy

OB/OD -- Open Burning/Open Detonation

OPLAN -- Operations Plan

PVO - Private Volunteer Organization

ROPU-- Reverse Osmosis Purification Unit

SJA -- Staff Judge Advocate

UN -- United Nations

UNMIH -- United Nations Mission in Haiti

USAID or AID -- United States Agency for International Development, a subordinate organization within the Department of State

ENDNOTES

¹ Dick Cheney, Secretary of Defense, "Defending the Environment," remarks at the Defense and Environment Initiative Forum, Bethesda, MD, 6 September 1990, 5 <u>Defense Issues</u> 40, (October 30, 1990): 1.

² The Author was dual hatted as the Multinational Force (MNF) Engineer, Haiti, and the Commander, 65th Engineer Battalion (Combat), 25th Infantry Division (Light). Captain Osborne commanded a provisional Headquarters Company established prior to deployment to Haiti. The company was comprised of an administration section, maintenance platoon and a vertical (general) construction platoon formed from elements of 65th CEB and the 84th Engineer Battalion (Combat) (Heavy), Schofield Barracks, Hawaii. In late February 1995, the 92nd Engineer Battalion (Combat) (Heavy) arrived in Haiti to construct basecamps for the United Nations forces scheduled to replace the MNF in early April. The 92nd CEB was placed under operational control (OPCON) of the MNF until 1 April. Mechanics and equipment operators from the 92nd CEB were placed OPCON to Captain Osborne's command for Jacmel. A Sapper platoon from Company B, 65th CEB, was also placed OPCON to Captain Osborne's command. Captain Osborne's command was further augmented by five Bangladeshi engineer equipment operators, six Government of Haiti (GOH) Department of Transportation and Communications equipment operators, and 90 local Haitians (dump truck operators and laborers). There were also numerous volunteer laborers from Jacmel. The mission was a leadership as well as a technical challenge. This "pick-up team" had a deadline critical to a US national objective. All elements came with their parent organization's equipment and of course maintenance challenges. The Haitians were hired by the GOH through the Mayor of Jacmel. From the outset, it was imperative that all stakeholders (MNF, UN, GOH and local populous) had participants in the mission. Captain Osborne not only faced language barriers but cultural challenges which he artfully addressed and ultimately completed the project one week ahead of schedule.

Route 204 had four damaged locations. Three made passage during heavy rains near impossible for most vehicular traffic including Haitian produce trucks transporting cash crops to market in Port-Au-Prince for consumption or export. Rudimentary repairs (three fording sites) were made by the 52nd CEB (redeployed to the US in January) that were further damaged in subsequent rains. All-weather passage of the road was not an

operational requirement for the MNF since alternative methods of transportation were available. However, all-weather passage was an operational necessity for UNMIH. The most critical site required backfilling a washed out bridge abutment with 5,000 cubic meters of earth and constructing a 250 foot long by 7 foot high wire enclosed rock gabion erosion control wall. This precluded use of a very hazardous nearby ford. Two other fording sites had to be improved substantially, one in particular was a deep water ford 270 feet long in moderately swift current. Safety crossing devices were installed to enable Haitian drivers to correctly gauge water depth in order to minimize the chance of driver mishaps.

- Initially, the MNF viewed route 204 as a civic action project requiring humanitarian assistance funding that was not available. Conversely, the UN considered it essential to support the Dutch basecamp near Jacmel and two others scheduled for construction. Hence, this made it an MNF operational necessity to effect the scheduled April mission transfer to UNMIH. Based on this, Colonel Bush, MNF SJA, determined the project met the operational necessity funding criteria -- transfer the MNF mission to UNMIH. The reader is referred to Brian X. Bush, Promoting Environmental Security During Contingency Operations (U.S. Army War College Carlisle Barracks, PA, 1997) 12 and 26.
- Deputy Secretary of State Strobe Talbot testifying before Congress identified three U.S. intervention objectives in Haiti. First, establishing a secure and stable environment. This meant removal of the Lieutenant General Cedras and the corrupt military regime. Second, establishing a democratic government. This meant returning the duly elected President Aristide to power and assisting him reinvigorate the legislative body as well as reestablish a national police force to maintain order. Lastly, accomplish market reform by abolishing tariffs, reducing civil servants, implementing a national budget and promoting privatization. Strobe Talbot, "Promoting democracy and economic growth in Haiti." US Department of State Dispatch. Vol: 6, Iss: 11 (March 13, 1995): 187-188, UMI Pro-Quest, General Periodicals on Disc [CD-ROM], item 02328802.
- ⁶ The Government of Haitian (GOH) recognized the importance of route 204 to revitalizing the cash crop economy. The Mayor of Jacmel was enthusiastic to re-establish his community's economic life line to Port-Au-Prince. Captain Osborne was remediating nature's environmental degradation that contributed to poverty and civil unrest in the Western Hemisphere's poorest country.

Repairing route 204 was a classic environmental security mission. The GOH provided funding to hire the Haitian laborers and equipment operators. The Mayor of Jacmel organized a volunteer labor force and coordinated real estate used by the engineers for a basecamp and barrow site for earthen fill and rocks. contributed funding to purchase the gabion mesh baskets used in the erosion wall as well as other construction materials. served as the intermediary between the MNF and the GOH to acquire laborers and equipment. AID representatives and US Army Civil Affairs soldiers were invaluable in this regard. The US provided all classes of supplies less construction materials. MG Fisher's quidance to get it done on time ensuring everyone with a stake in the project participated was achieved in large measure due to two people; Captain John Osborne at the project site, and Captain Marcus Fielding, Royal Australian Engineers, an exchange officer assigned to the 65th CEB who was the project design officer.

- ⁷ Sherri Wasserman Goodman, Deputy Under Secretary of Defense (Environmental Security), <u>Environmental Issues, Natural Resources</u>, and <u>U.S. National Interests</u>, presented at the National Foreign Affairs Training Center (NFATC), 10 September 1996, INTERNET:http://denix.cecer.army.../speeches/speech-23.html accessed 11/22/96: 4.
- ⁸ Military operations are rife with environmental issues and challenges arising from the actions of US forces as well as problems in the host nation. Military leaders must understand that environmental issues may be factors leading to instability and conflict necessitating the commitment of US forces in the first place.
- 9 Extrapolation, making an educated guess outside the bounds of known data, is risky applying peacetime requirements to MOOTW. In the interest of brevity, a discussion of existing quidance or the absence there of for environmental security in MOOTW is relegated to this footnote. The author's personal experience using the Overseas Environmental Baseline Guidance Document (OEBGD) verified it is inadequate for MOOTW. It was intended for use in locations where the US has basing rights. In MOOTW, the US will conduct either a forced entry such as in Somalia or permissive entry such as in Haiti into a country which the US did not have basing rights. Nor is it anticipated in future MOOTWs the US will have basing rights. The Draft DODI 4715.II referenced in the bibliography likewise is not applicable to Joint Doctrine is not prescriptive. Joint Pub 4-04 buries environmental security under the engineer in the J-4.

Moreover, the two page treatise is woefully inadequate for planning and execution. There are several other source documents and assessments in the bibliography to which the reader can refer. The genesis is the thesis of this monograph. COL Bush's evaluation on pages 5-13 of his monograph lays out in detail the DOD policies and legal issues which may be used in MOOTW but are not specifically applicable without some interpretation. Other source documents are the Operational Law Handbook and Environmental Law for Department of Defense Installations Overseas.

 10 The Deputy Under Secretary for Defense (Environmental Security) recognized this gap and appointed the Army as executive agent to develop an environmental security policy for MOOTW. Army Environmental Policy Institute (AEPI) is currently developing this policy. COL Carr, a 1997 Army War College Fellow at AEPI, developed the some guidelines for consideration in this policy. The author provided input to COL Carr in the spring of 1997 based upon experiences in Haiti and experiences as an environmental staff officer, Directorate of Environmental Programs, Assistant Chief of Staff for Installation Management (ACSIM). COL Carr made a concerted effort to dovetail his policy development efforts with environmental doctrine efforts on-going in the Services and the Joint staff. COL Carr's efforts are being incorporated into a document being developed by COL Weisser, a 1998 AWC Fellow at AEPI. He is working through a DOD chaired, interagency work group commissioned under the direction of DUSD(ES). Hopefully, these activities will produce a much needed DOD Environmental Security for MOOTW.

Nina Groeger, "Environmental Security?" 33 <u>Journal of Peace</u> Research 1 (February 199):110.

Marvin S. Soroos, "Environmental Security: Choices for the Twenty-First Century," 75 National Forum: Phi Kappa Phi Journal 1 (Winter 1995): 20-21. There are numerous authors who have written on environmental security. In the interest of space, the author has purposely limited the discussion. The key point is that environmental security is a national security issue for DOD. For further discussion on this, the reader is referred to the bibliography with the recommendation to start with the speeches by Secretary of State Christopher and works by Author Ken Butts.

¹³ Groeger, 109-11.

¹⁴ Military operations will be influenced by "phenomenological threats" such as environmental disasters, famine, population dislocations and illegal immigration. Success may be contingent

in these MOOTWs based upon how well the military mitigates the environmental impacts from: collateral damage due to the application of maneuver and firepower, such as the destruction of public utilities; wanton and unnecessary damages that cannot be justified by military necessity under the rule of proportionality, gains do not justify the costs; and modification of the environment causing widespread and long-lasting or severe damage to gain tactical or operational advantage, such as Iraq's burning of Kuwaiti oil fields. One cannot under estimate the impact of news coverage in the court of public opinion. Joseph C. Conrad, Environmental Considerations in Army Operational Doctrine, White Paper, January 1995.

INTERNET:<http://www.wood.army.mil/dtle/environ/wpcont.htm>
accessed 3/27/97: Chapter 4 1-6.

- The White House, <u>A National Security Strategy For A New Century</u>. Washington, DC: US Government Printing Office, Mat 1997: i.
 - ¹⁶ Ibid, 1.
 - 17 Ibid, ii.
- Shape, Respond, Prepare Now: A Military Strategy for a New Era, Washington, DC: US Government Printing Office, 1997: 1.
- ¹⁹ Environmental security is attained by shaping the international environment through peace engagement activities and alliances. Military-to-military contacts, exercises abroad with allies, training foreign students at US military facilities, and presence abroad are examples that can further US environmental security. Although not the subject of this monograph, it is worth comment for completeness. Ibid, 3.
 - ²⁰ Ibid, 2, 9 and 10.
- Margaret Daly Hays and Weatley, Gary F., <u>Interagency and Political Military Dimensions of Peace Operations: Haiti A Case Study</u>. National Defense University, Institute for Strategic Studies (February 1996). INTERNET:
- <http://www.ndu.edu/ndu/inss/books/haiti/haithome.html> accessed
 10/09/07: 18.
- The examples of challenges, solutions and long term impacts are based upon the author's experiences in Haiti as the MNF conducted operations and prepared the mission for hand-off to UNMIH forces.
- The MNF medical hospital was located at Camp Democracy in Port-Au-Prince. It was designed to provide medical support to an 18,000+ force used in the initial stages of the operation. By the time the 25th IDL received the mission in January 1995, the

US-led MNF was reduced to approximately 6,000 service members plus other US agency personnel who were supported by this facility. Additionally, Haitians injured in incidents with US forces received treatment in this facility. A case in point, the author was enroute to the multi-purpose range complex with the MNF Chief of Staff when the author's vehicle was struck by a Haitian car. All parties were treated at the medical facility. One must remember that Haiti has a very high incidence of HIV, tuberculosis and other communicable diseases. All the waste had to be treated and disposed of as infectious wastes.

There was no plan to ship these potentially infectious materials to a treatment facility in the US. After the 25th IDL assumed the mission from the 10th Mountain Division, an incinerator capable of attaining 2,500 degrees Fahrenheit was programmed for installation at the request of the medical facility commander. The MNF engineer directed the logistics support provider (LOGCAP), then contracted to Brown and Root, to install the incinerator as soon as possible. In early February, the MNF Commander restricted facility upgrades. This occurred for two reasons. First, operations and maintenance (OMA) funding to the mission was severely reduced. Second, the scheduled change over date from the US-led MNF to UNMIH was publicly announced. Thus any expenditures had to be for immediate force protection or operational necessity. The incinerator was put on what appeared to be "terminal hold." Neither the medical facility commander nor the author relished the only disposal option available, on-site burial. It was an acceptable operational solution under military expediency; however, it did not sit well given the stable environment in Haiti. given the severe environmental degradation in the industrial complex where Camp Democracy was located, and the fact that it was the heart of the Haitian industry in Port-Au-Prince, burial just was not the right thing to do. The UN request for the incinerator freed the funds. It was installed in late March 1995.

Like the route 204 upgrade, operational necessity with the UN as the catalyst provided the vehicle to implement the best environmental and force protection solution. This would also occur in the Cap Haitien sewerage disposal facility upgrade and the well for potable water. The short term expedient solutions initially taken by the MNF in several cases required remediation efforts to mitigate the environmental impact, protect the future UNMIH forces and reduce the health risks to the Haitians. The

unanswered question is why had the incinerator, previously planned, not been programmed for installation until after the 25th IDL assumed the mission from the 10th Mountain Division in January 1995? One cannot downplay the negative impact subsequent media attention could have shed on the US mission if a less stringent disposal method such as on-site burial produced a health risk to UNMIH forces and/or the Haitian populous.

Paraphrased from Richard Phelps, <u>Environmental Law for Department of Defense Installations Overseas</u>, Headquarters, United States Air Forces in Europe, 3rd Edition, March 1997. INTERNET: http://denix.cecer.army...overseas/overseas.html accessed 5/14/97, 16-17.

Once the intervention changed from a forced entry to a permissive entry, 18th Airborne Corps commenced a series of force protection measures to ensure the success of the mission and also protect US and coalition forces. The equipment pacing items of 18th Airborne Corps were the SSTs (Super Sucking Trucks) used to remove human waste from the Port O'Potties and the water transports.

²⁸ COL Bush in his monograph outlines the legal issues involved on pages 11 and 25. They will not be repeated here. The disposal facility in Port-Au-Prince was a well designed facility and situated to minimize contamination of the local aguifer and the Caribbean Ocean. It consisted of three settling ponds in series with proper soil bed liners to mitigate leeching The anaerobic process biodegraded the human into the acquifer. waste such that the water leaving the final ponds was quite clean, though by no standards potable. Unfortunately, the waste disposal facility at Cap Haitien which handled a brigade size force was not well situated nor well designed. The entire area had a very high ground water table. The disposal site was up gradient of the city, the basecamp and the planned well site. Moreover, the disposal site was a series of slot trenches cut by the contractor the width of a bulldozer and about 4 to 5 feet deep. As a trench was filled to capacity another was cut. of the local populous of Cap Haitien also used this facility. March, as the mission transfer date approached, the author directed the LOGCAP contractor to build a one pond properly lined facility which would meet the minimum standards for an anaerobic disposal pond. The new disposal facility was completed in mid-March. However, previous poor planning by the MNF produced a potential health hazard. This became a severe force protection issue when the MNF removed the reverse osmosis water purification units (ROPU) that produced potable water and looked for a potential well site as a replacement for the Pakistani battalion that would remain at Cap Haitien. The well was installed but tapped a different aquifer several hundred feet deep.

An interesting aspect of this was water consumption by the Bangladeshi Battalion. Their culture standards of cleanliness necessitated frequent bathing. Hence, their consumption was roughly equal to that of the entire 2nd Brigade/25th IDL stationed on the same basecamp. The author coordinated with the Bangladeshi Commander requesting he implement measures to reduce this consumption. Although some minor reductions were achieved, it was very difficult to continue dust control and at the same time request a coalition partner curtail practices which were culture norms of his society. In the end, several roads were upgraded to semi-permanent surfaces using a bituminous application with stone aggregate. This substantially reduced the water consumption, averted rationing procedures and the need to drill another well. Better coordination on the aguifer capacities with the AID representatives and GOH hydrologists and geologists early on could have precluded the near disaster that almost came to fruition in the last days of the US-led MNF mission.

This was prudent given the duration of the MNF mission was unknown at that time. It was necessary to periodically verify weapon system readiness, particularly that of the rapid reaction force. These forces were composed of M-2 Bradley Fighting Vehicles and the M-19 40mm grenade launchers. Periodic weapons firing also reinforced to the Haitians the MNF resolve to maintain order. All types of small caliber weapons plus the Bradley Fighting Vehicle chain gun and the M-19 40mm's were fired at this complex.

The range was a morale boost for soldiers in the MNF. It not only assisted commanders maintaining weapon proficiency, it diverted attention from the drudgery of daily activities. Soldiers felt like soldiers training to go to war while executing MOOTW.

The US military offered money to entice Haitians to surrender their arms. The sliding scale payment system produced over 30,000 weapons at a cost of over 2 million dollars.

Disposal at sea was unacceptable. Even if legal, numerous proponents indicated it was not, the adverse media coverage and ensuing public and congressional outcry would have jeopardized the mission. Burial was unacceptable because of the potential

for Haitians to unearth the weapons and rearm. Even if the weapons were entombed in concrete, there was a fear Haitians would chisel them out. Although cumbersome in clearing customs, shipment to the US was a final option implemented for those Haitian army weapons not destroyed through OB/OD and most of the weapons from the buy-back program. Approximately, 15 million rounds of various munitions from pistol and rifle calibers to artillery rounds were disposed of at this facility. Additionally, large caliber Haitian Army weapons such as heavy machine guns, mortars and artillery were destroyed here.

- During a site reconnaissance, COL Drummond, Chief of Staff, MNF and 25th IDL, jestfully remarked to the author while deftly walking through the duds that Bronze Stars would be appropriate for the risks.
- ³⁵ COL Bush in his monograph outlines in detail the legal and regulatory issues involved in closing the range. The reader is referred to footnote 27 on page 25 of this document for details. He was an invaluable advisor to the author while staffing the closure proposal.
- Because the Army Commander was dual hatted as the MNF Commander, approval had to be initiated through the service command to ACOM. A key element in the review was the DOD Explosives Safety Board. JCS coordinated the proposal with them in accordance with Army Regulation 405-90, Disposal of Real Property and AR 385-64, Ammunition Standards. Ultimately, the range, even though technically not real property, was treated as real property to protect the interests of the US in the event a mishap occurred involving a Haitian after the range was closed. The intent was to attain full protection for all involved. In hindsight, it was merely common sense and the only cost effective solution available. Yet, the approval process was slow and completion did not occur until the summer of 1995, well after the MNF had transferred the mission to UNMIH and regrettably not in time to prevent Haitian casualties.

The CREST was composed of three to four individuals. Since ACOM was the responsible CINC, the CREST was formed from reserve component SEABEES and Department of the Navy civilians.

³⁸ In most cases the MNF had upgraded electrical, sewerage where it existed previously, and water utilities in facilities occupied by the MNF. It is a cultural norm for Haitian businessmen to claim damages then negotiate the best position they could obtain. In many cases, the CREST offered to remove the improvements and return the property to the pre-lease

condition. This typically quelled the claimants desires for monetary compensation when they realized it came at the cost of all US installed improvements being removed.

³⁹ In some cases, the property was seized and occupied prior to survey. This can not be helped in extreme cases of operational necessity. The key is to get a good assessment as early as possible with photographs. In two cases the US either had damaged property or did not have a complete site survey. first case was a basecamp location north of Port-Au-Prince the MNF had leveled and covered with gravel. Once the 18th Airborne Corps returned to the US, the site was abandoned. The CREST was able to negotiate a settlement with the owner since the field clearly was not usable as a pasture. Although it is questionable the land ever was capable of this, nonetheless in the absence of complete documentation the US had to settle for environmental In the second case, a house occupied by signal corps personnel on a mountain south of Port-Au-Prince had a damaged roof. Again complete survey data was not available and the owner filed a claim against the US for damages.

 $^{
m 40}$ The UNMIH representative was difficult to say the least. Improvements to the basecamps such as gravel roads, hardstands and other permanent improvements were not accepted carte blanche. If the lessor indicated there would be a claim for damages, the UNMIH representative required the MNF resolve this through negotiations or make repairs to the satisfaction of the lessor. Fortunately, these cases were rare. In the case of the industrial complex, the author personally told the lessor in the presence of the UNMIH representative that the claim submitted was less then the value of the property improvements made by the MNF; complete electrical, interior lighting, water and sewerage, and extensive interior partitioning etc. The author offered the option to accept the value of the materials in place, or the author would have the engineers remove all these items and then the lessor would have his building in its original state. the lessor and the UNMIH representative saw the light of day and dropped the issue.

USACOM under the Goldwater-Nichols Act of 1986 is responsible for training forces provided to the geographical CINCs. Under this mandate, USACOM implemented a program to train potential JTF commanders and staffs to plan and execute contingencies. Environmental security is one area included in this training.

- This document is not finalized. It is an excellent compilation of lessons learned and has a series of detailed questions that address many of the issues encountered by the author in Haiti.
- 43 The JEMB is similar in concept to the targeting board utilized by commanders to synchronize all supported commanders' requirements in allocating available assets to service targets. The JEMB is an ad hoc board that establishes policies, procedures, priorities and direction. Through it, the commander and staff address a host of environmental issues by phase; deployment, conflict, post-conflict and redeployment. The JEMB evaluates the planned operational impacts on the environment addressing; media releases (air, water and ground), solid wastes including hazardous waste, natural and cultural resources, compliance inspections by US and coalition forces, audits, host nation and NGO coordination, spill prevention and response, POL-MIL, and closure plans (exit criteria). The JEMB identifies all environmental security issues and integrates the JTF actions to accomplish the mission while minimizing the adverse environmental impacts. The JEMB is a focal point where all affected parties surface their issues. This includes but is not limited to all service representatives, primary staff elements, DOS representative, civil affairs, NGOs, PVOs, IOs, other US agencies, the host nation etc. Direct participation may be limited based upon security issues, however surfacing concerns through intermediaries is paramount. The key point is the Chief of Staff must participate to ensure Command visibility is retained just like that accomplished in the targeting process during combat operations.
- ⁴⁴ Patrick Clawson, ed., <u>Strategic Assessment 1996:</u> <u>Instruments of U.S. Power</u>. Washington, DC: National Defense University Press, 1996: 16.
- The White House, <u>A National Security Strategy For A New Century:</u> 12.
- ⁴⁶ There are four US elements of national power; political, economic, military and psychological.
 - 47 Goodman, 2-3.
- ⁴⁸ Sherri Wasserman Goodman, Deputy Under Secretary of Defense (Environmental Security), <u>The Environment and National Security</u>, presented at the National Defense University, Washington, DC, 8 August 1996, INTERNET:

<http://denix.cecer.army..../speeches/speech.22.html> accessed
11/22/96: 43.

- ⁴⁹ At the operational level, military planners prepared for civil-military operations in Haiti without being able to talk to civilian counterparts due to security and compartmentalization. This contributed to initial confusion on the ground. Military leaders expected to find civilian agencies ready to begin operations because the entry was permissive. They did not recognize the difference in lead times for US agencies relative to DOD. As a Brigade Commander in the 10th Mountain Division stated, "We were going into a fourth world nation, but we didn't know the limits of our civilian agencies." Civilian agency planners on the other hand were upset the military refused to accept responsibility for civic action projects and nation-building efforts at the outset. Hays, 16-18.
- Warren Christopher, Secretary of State, American Diplomacy and the Global Environmental Challenges of the 21st Century, presented at Stanford University, 9 April 1996. INTERNET: http://www.state.gov/www/global/oes/speech.html Accessed 10.09/97: 3.
- DUSD(ES) outlines how this resource will utilize EPA's technical expertise, the innovation of Department of Energy's national labs and facilities, the intelligence communities information gathering and analytical capabilities, and Department of Commerce's industrial contacts coupled with AID's development programs. Goodman, 4.
 - 52 Clawson, 15.
- The objective at the operational level (CINC and theater commander) is to develop Mission Capability Packages to provide coherent, comprehensive approaches to a particular set of environmental goals. This improves the linkages between DOD, other agencies and the technical community. Environmental Diplomacy: Environment and U.S. Foreign Policy. Washington, DC, Department of State US Government Printing Office, 22 April 1997. INTERNET:http://state.gov/www/global/oes/earth.html accessed 10/9/97: 5.

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